AUSTRALIAN SUPPLEMENT
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"VETERINARY JOURNAL."

By Members of the Staff of the Veterinary School, Melbourne University, Australia.

INTERFERENCE IN VARIOUS GAITS AND SOME SUGGESTED REMEDIES.

By E. F. J. BORDEAUX, B. ès L., B.V.Sc.
Lecturer in Zootechny and Shoeing, Veterinary School, Melbourne University.

I PROPOSE to briefly describe the various forms of interference which have come under my notice, and suggest remedies where possible.

The examples which I will give are the most exaggerated forms which I have come across. As every experienced horseman knows, these defects vary in intensity from a slight defect to pronounced unsoundness.

It is difficult to classify forms of interference, so I will consider them at the various paces, *i.e.*, walk, trot, and gallop. I have purposely omitted pacing, which, though claimed to be a natural gait, is acquired in many instances by the use of hopples. The difficulty of passing from this gait into any other has caused pacing to be excluded from the Army and riding schools.

Interferences at a walk.—Stumbling, brushing, striking, cutting, overreaching.

Stumbling may be defined as an inability of placing the foot on the ground in a normal way, heel first.

Causes.—Low withers or straight shoulders and pasterns, which cause the centre of gravity to be too far forward. Lymphatic temperament. In young horses it is often due to clumsiness. It may also be caused by unsound joints preventing complete flexion or extension, or unsound feet, especially on rough and hard ground.

Remedies.—Conformation cannot be altered, but extension may be developed by suitable exercise. The centre of gravity may be moved backwards by teaching the horse to carry his head

XUM

high, which will also increase the forward reach of the front limb by tension on the M. brachio-cephalicus. Suitable shoeing, such as turning up the toe, may cure or mitigate the evil. Sluggishness is best remedied by vigorous riding or driving. Clumsiness by a course of riding school work, which, when judiciously done, will improve any horse, and turn a clumsy animal into a serviceable and agreeable hack or driving horse. Should stumbling be due to unsound joints limiting flexion, there is no remedy unless the unsoundness can be removed by rest or surgical methods. Tender feet may be improved by shoeing, such as removing pressure from affected parts or using rubber pads. A confirmed stumbler is only fit to drive in a four-wheeled conveyance.

Brushing is a continual tapping of one foot against some part of the opposite limb.

Causes.—Defective conformation, such as narrow body with knees and toes turned out, and cow hocks. In narrow-chested horses with toes turned out, the brushing is due to the inward swing of the foot during flexion. After careful examination of a great many unshod feet, I have come to the conclusion that the majority of horses do not wear level behind. In the majority of cases the outside wall is shorter than the inside one. If the foot be levelled by the farrier, the horse may brush even when his conformation is good. Horses with narrow croups and cow hocks are most predisposed to brushing behind. The rocking of a heavy vehicle, especially a two-wheeler or the weight of a heavy rider or breaking work, will increase the tendency to brush. I may point out that a horse which goes close without actually touching will brush when put in a new kind of work, or when a swelling appears on any of the limbs near the place where the opposite foot clears it. Given a good conformation, brushing may be caused by want of condition, overwork, or bad shoeing. The most common faults in shoeing are: firstly, uneven bearing surface, one side being left too high, or else an attempt being made to straighten a foot of which the wall is naturally lower on one side than on the other; secondly, rasping the inside surface of the wall, with the intention of giving more room to the foot to clear the opposite limb, when in reality it only spoils the ground surface of the foot without attaining the object aimed at; thirdly, the so-called brushing shoe, usually fitted close on

XUM

the inside (even under the sole, as the wall has usually been rasped away) and full on the outside. This practice may place the feet slightly further apart, but invariably brings the fetlocks closer together.

Nature having moulded the horse's foot to a certain shape, I will not admit the capacity of the farrier to improve on it. I would suggest that technical education might improve the shoeing smith.

Remedies.—Cases due to want of condition should be remedied by a generous diet and well-regulated work before interfering with the feet; the reverse is the usual procedure. For front feet, a slight alteration in the swing of the limb will avoid the interference, and to obtain that the toe of the shoe may be made square, and even a small piece welded on to the outside toe in a line with the front of the shoe. The object of this is to make the horse "break" straighter over the toe. *In no case must the wall surface be rasped away.*

I have seen many devices tried by blacksmiths to "cure brushing." I am convinced that the remedy nearly always induces a condition worse than the original trouble. The best remedy, when the foot has not been mutilated by rasping the surface of the wall, is to exercise the horse without shoes until his feet have worn themselves to their natural bearing, and then to apply a well-fitting shoe, following exactly the outline of the wall, except perhaps at the extremity of the heels where the fitting may be slightly fuller, *but it must be the same on both sides of the foot.* I may state that I have adopted this system in every case for many years, and have found it almost infallible, the only exception being when the conformation or action are extremely defective.

One of the worst cases of brushing I ever saw was in a two-year-old thoroughbred, which was very narrow and very leggy. The only pace at which this horse could clear his legs was the gallop, at which he showed a great turn of speed for a short distance.

Walking or trotting he plaited (placed one foot in front of the other), and injured himself to such an extent, notwithstanding the protection afforded by boots, that his training had to be given up.

Striking is a severe form of brushing, and is very uncommon at a walk.

Cutting is a form of brushing aggravated by an abrasion of the skin, caused either by the sharp border of the shoe or by a defective clinch.

Overreaching being more common at the faster paces will be considered later.

Interference at a trot.—These include stumbling, brushing, speedy cutting, bruising of elbows, overreaching, forging, and scalping. Most of the interferences at a trot take place when the "pace is on," except forging, which is sometimes caused by lazy going, coupled with careless or incompetent driving.

As a rule, the faster the speed the greater the injury when interference does take place.

Stumbling, brushing, striking, and cutting are produced in the same way as at the walk, but the consequences are usually more serious.

Speedy Cutting, so-called because it usually takes place at a flying trot, is an injury under the knee caused by the opposite front foot. The result may be a simple bruise with a thickening of the skin, or a hæmotoma or an exostosis (the so-called knee spavin). As speedy cutting is attributable to the same causes as brushing the same remedies may be applied, bearing in mind that light shoes and lowering the head will have a tendency to make the horse go "closer to the ground." Pacers which have a tendency to brush or speedy cut sometimes wear a spreading gear connected to the shaft of the sulky to prevent them from striking. This is one of the many patent gears which may be seen at trotting courses.

It is hardly conceivable that the rules of racing allow the use of such contrivances to correct defects of conformation or gait. A horse requiring this sort of mechanical help would be useless for ordinary purposes, yet he is sometimes allowed to win big stakes by racing.

Cutting or bruising of the elbow by the feet is sometimes seen in horses with extravagant action.

Remedy.—Apply light shoes and, if possible, lower the position of the head. If the defect persists or the above means are not applicable, elbow pads are the best palliative.

Interference between the front and hind limbs happens either at the end of the stride, just before the fore limb leaves the ground, or during the period of suspension.

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Overreaching happens at the end of the stride; the toe of the hind foot catches the heel or quarter of the fore foot just on the outside quarter of the fore foot, but it may be sometimes on the inside. It is not an uncommon thing for a horse which has a tendency to strike his fore and hind legs together to travel with one hind foot between the two front ones, the other hind foot moving on the outside of the fore limbs; this defective gait (sometimes termed cross-firing) explains why the injury is possible on the inside as well as the outside quarter or heel.

Forging or Clacking takes place at the beginning of the period of suspension; the noise, which is most objectionable may be accompanied by a wearing away of the wall of the hind foot, which may ultimately cause lameness.

When the interference takes place later in the period of suspension, it is the coronet, suffraginis, fetlock, metatarsus, or even the inside of the hock which gets struck by the front foot, and this defect is known as *scalping*. As a rule, the greater the speed the higher the injury. For this reason, marks on the metatarsus are generally referred to as speedy cutting in the same way as the marks under the knees in the fore limbs. Violent or continuous striking of any of these structures may result in conditions such as exostosis, arthritis, &c. Some veterinarians will not admit the traumatic origin of side-bone. But I am quite convinced that in light horses, and particularly in fast trotters, a side-bone may be produced solely by traumatism. When only one side-bone is present, and that under the scar produced by overreaching, it is hardly necessary to look for another cause. I could name numerous instances of this. The causes of interference between the fore and hind limbs may be low withers, or any other cause which has a tendency to overload the forehand, and place the centre of gravity forward, or to delay the action of the front limbs, but the most common cause is an excessive length of limb in proportion to the body. Forcing the pace will create or aggravate the evil. A horse which is " over paced " sometimes develops a hop or skip behind to avoid scalping. This fault, when well established, is hard to eradicate.

The remedies for interference between the front and hind limb at a trot are: Development of the extensors of the fore limbs by heavy shoes; transference of the centre of gravity backwards by elevating the head, which will also increase the forward reach of the fore limbs by tension of the M. brachio-cephalicus; preventing the horse from dwelling on the toe in front by turning up the shoes. (This method is supposed to shorten the stride and reduce the pace.) Not allowing a horse to move very fast until

he has been well gaited and carries good condition. Drive steady, but keep the horse up to the bit until fit.

American farriers claim to have invented a variety of shoes to "spread" the horses' hind feet out and make them step outside of the fore feet. I have no faith in these appliances. I have seen good horsemen attain the same results without them, and I have also seen the appliances fail to produce the wonderful effects claimed for them. As a rule, the more incompetent the horseman, the more artificial and mechanical aids he will look for.

Before dealing with the interferences at the gallop, it might be as well to give a definition of this pull and draw attention to the phases of contact and suspension. The gallop may be defined as a pace in four time, in which the almost simultaneous beats of one diagonal biped occur between the two successive beats of the opposite diagonal biped, which commences the stride with the corresponding posterior limb. Each stride is separated from the next by an interval of suspension.

The order of contact of the limbs is:—

(1) When leading on the near fore: off hind, near hind, off fore, near fore, suspension.

(2) When leading on the off fore: near hind, off hind, near fore, off fore, suspension.

Many horses which cannot clear their legs laterally when walking or trotting never touch themselves at a gallop. Striking of two front or two hind legs is more of the nature of an accident and is often attributable to an outside cause, such as a bump inflicted by another horse, or a sudden pull on the mouth causing a lateral displacement of the centre of gravity. Under normal conditions, especially when the horse is of the "narrow gauge" variety, the lateral displacement of the centre of gravity at the gallop is very slight. This may account for the rare lateral interference at that pace.

On the other hand, interference between the fore and hind limbs is fairly common.

The periods of contact in the gallop are about of equal duration, except in the case of the leading leg, which is a little longer, and it is this leg which is generally the cause of the trouble. As in the trot, the interference takes place either at the end of the stride because the leading fore leg has not got away quick enough from the opposite hind one, or during the period of suspension.

Overreaching is an injury caused to the leading fore leg at the heel or higher, even as high as the knee, by the opposite hind leg just before the period of suspension.

During the period of suspension the toe or inside quarter of

the leading fore leg may strike the opposite hind one at any place between the coronet and hock. The most common cause of injury between fore and hind legs at the gallop is an excessive length of limb in proportion to the body. This explains why so many two-year-old horses show this defect and get rid of it when they are fully developed.

In some cases, however, the "leggy" conformation persists, and so does the interference.

Another cause is overweighting of the forehand due to a heavy conformation, low withers, or the position of the rider (Sloan seat). Overreaching may be sometimes caused accidentally by a sudden pull on the mouth, especially when the horse carries a curb.

Injuries inflicted at a gallop may be very serious, especially when the traumatism is near a joint.

Beyond shoeing with tips in front and placing the rider further back there is little to be done. I am convinced that a course of "school" work would produce much improvement, but racing men would never consent to the experiment. They even sometimes resent the suggestion that the jockey should be asked to sit a little further back.

Injury to the elbow by the foot of the same leg appears uncommon in galloping horses. This defect is supposed to be incompatible with speed, but Velasquez used to injure himself in that way, and he was a first-class racehorse. Newhaven showed the same defect at the time he won the Melbourne Cup. The best palliative is to remove the shoes for fast work or racing. Finally, a horse may blemish himself when lying down or standing. The so-called "shoe boil" is caused by the horse lying with his heel pressing against his elbow. The cause of it is, I think, a narrow stall or box, or just ordinary confinement, as I have never seen it in a horse living in the field. The remedy consists is placing round the suffraginis a sufficiently thick circular pad to prevent flexion of the suffraginis on the metacarpus. Most horses will become quite accustomed to these pads, which seem more practical than an elbow pad. A steeplechaser once developed a shoe boil, and was fitted with a pad round the suffraginis of the offending leg, but he promptly developed the same blemish on the other side; another pad was placed on the second leg, and the trouble ceased.

A standing horse may blemish himself by placing one heel on top and in front of the other foot, which may result in an injury to the coronet. This attitude may be adopted by unsound horses to relieve the pressure on contracted tendons or spavined hocks; sometimes it is merely a bad habit with no apparent cause.

SPLENIC ABSCESS: A SECONDARY AFFECTION TO PARASITISM BY *SPIROPTERA MEGASTOMA* IN THE HORSE.

By H. R. SEDDON, B.V.Sc.
Veterinary School, University of Melbourne.

Specimens of spleen showing purulent and necrotic lesions have on several occasions been sent to this institute for examination. The history in these cases has been that of rather sudden death after a comparatively short illness, though some symptoms may have been shown for the previous three or four weeks. The specimens have been chiefly from aged draught stock and the cases have occurred chiefly in the summer.

The spleen has contained a huge abscess—up to the size of a football and occurring usually rather nearer one end of the organ. This abscess enlarges the organ to about an equal amount on either side and is somewhat sharply circumscribed, but not encapsulated, nor is the capsule of the organ thickened to any great extent. On section little purulent material is found, but the "abscess" seems to be made up of areas the size of a pea of necrotic material, those areas being packed closely together with little fibrous tissue between. In colour the central areas are greyish or yellowish and towards the periphery they acquire a red or hæmorrhagic appearance. The spleen pulp surrounding this necrotic lesion is softer than normal and intensely congested.

Microscopical examination of the lesions shows numerous streptococci.

Recently a further specimen was sent, where, in addition to the necrotic lesion in the spleen, there was fibrous adhesion between that organ and the stomach and in which the liver was also involved in the inflammatory process.

An opportunty presented itself of investigation on the property from which this last-mentioned specimen was sent, and it was only then that the mode of entrance of the streptococci was definitely determined.

Here was found a two-year-old filly which I was informed commenced to fall away six weeks previously. The animal was now much emaciated in spite of the fact that during this period of illness it had been especially cared for by the owner, and had retained a good appetite. It had a staring coat, was very weak, and when forced to move dragged the hind limbs. The mucous membranes were blanched and showed some petechial spots.

There was an œdematous swelling along the floor of the abdomen. Temperature was subnormal.

The filly was killed and *post-mortem* examination revealed the following: Blood obviously hydræmic. Œdema of subcutaneous tissue of maxillary space, inferior cervical, pectoral and abdominal regions. The pleural cavity contained a slight excess of fluid and the pericardial sac about 5 oz. of clear straw-coloured fluid. The lungs and heart were normal. The abdomen contained a slight excess of fluid. The liver and kidneys appeared normal. The stomach wall contained several large worm tumours, the largest being the size of an orange. On incision this large one was seen to have been practically converted into an abscess. No parasites remained and a large cavity containing greyish white, purulent material filled the mass. A sinus extended through the wall of the stomach and into a thick mass of fibrous tissue which joined the spleen and the stomach wall. In the splenic tissue opposite this fibrous attachment there was a fluctuating mass the size of a coconut. On section this abscess presented the characteristic appearance, viz., greyish necrotic material in centre; no pus formation, though the whole was very soft; and the periphery somewhat hæmorrhagic.

Microscopical examination shows numerous long chains of streptococci present throughout the splenic lesion.

Beyond this large abscess the remainder of the spleen appeared normal.

Other worm tumours in the stomach showed numerous parasites (*Spiroptera megastoma*) and only the usual small quantity of purulent material (containing living parasites) exuded on pressure. The omentum was increased in size and œdematous and the chain of lymphatic glands lying therein markedly enlarged, hæmorrhagic and œdematous. The small intestines contained a few parasites, but the cæcum and double colon were extensively infested with various species of nematodes, Cylicostomum species being especially numerous. The mucous membrane showed numerous pin-point hæmorrhages.

On the same property was another filly exhibiting the same symptoms and in addition marked tenderness on palpation over the region of the spleen, the animal being probably affected with the same complaint, including an abscess of the spleen.

The owner of these animals informed me that he had had, in addition to the three animals mentioned (two seen by me and specimens from the third), another animal affected similarly. The general trend of symptoms, it should be mentioned, was the same in all these three animals, viz., gradual loss of condition for three to six weeks, great weakness and death, the appetite keeping good till the end.

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This fourth animal was a filly which had died three months previously (in the spring). *Post-mortem* examination by the owner had shown multiple abscesses of the liver with adhesions between that organ and the stomach. The stomach, unfortunately, was not opened, nor was the condition of the spleen especially noted.

While in that district an opportunity presented itself of conducting a *post-mortem* examination on another horse—a yearling —which was killed when apparently *in extremis*. This animal was badly affected with parasites of the large intestine and also presented numerous (the majority very early) worm tumours of the stomach. There were in this animal also inflammatory changes in the omentum, marked by increased vascularity and œdema, and a small abscess about the size of an acorn was present just underneath the serous cavity of the stomach. This abscess likewise communicated with a spiroptera tumour of the stomach. The lungs of this animal showed broncho-pneumonia, evidently the result of a drench that had been given, there being still traces of oil in this organ. Had this animal survived the effects of the intestinal parasitism (and also the drenching) it would similarly, no doubt, have shown more marked lesions in the omentum and the spleen.

Enquiries of owners elicited the fact that there had been no corresponding mortality heretofore, other than a case which occurred in 1907, which was also a drought year for that part. This animal was an aged mare with three-months-old foal at foot. She suddenly commenced to fall away in condition and died in about a fortnight. *Post-mortem* examination by the owner showed "a tumour in the spleen the size of a football." It seems likely this was a similar case.

It would be noted that *Spiroptera megastoma* is very prevalent in Victoria, but although the writer has had the opportunity of examining many horses affected with this parasitie he has not previously encountered this secondary affection of the spleen.

It should be noted, however, that these cases recorded occurred in a district which had been badly affected by the drought. Grass pasture had almost disappeared and the animals were being fed on chaff. Perhaps these unusual conditions were responsible in some way for this affection.

It is to be observed that in the cases investigated infestation by Cylicostomum was heavy and was probably sufficient to cause many of the symptoms, so that it seems as if the whole illness and death is to be referred not only to the effects of the spiroptera and the streptococcic lesions in the spleen, but also to the effects of these intestinal parasites as well.

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Clinicals.

ADENO-CARCINOMA OF UNDESCENDED TESTIS.

By J. C. LEWIS, D.V.Sc., B.Sc.
Lecturer in Surgery and Anatomy, Melbourne University.

UNDESCENDED testis in the dog does not appear to be a common occurrence, and though abdominal retention has been observed at the Hospital Surgical Clinic several times associated with inguinal hernia, it is the first case of undescended testicle retained in the inguinal canal that has come under my notice.

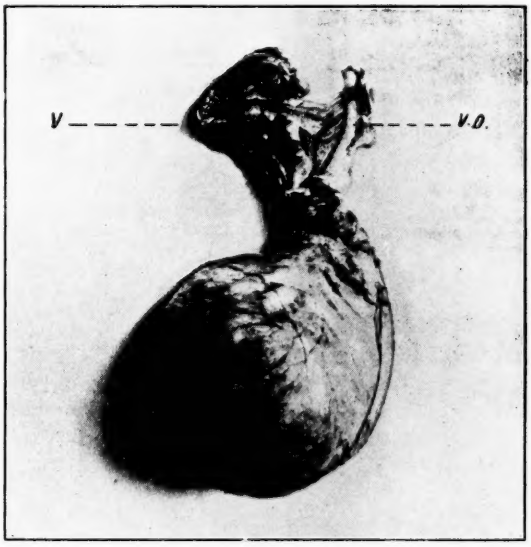

FIG. 1.—Illustrating case of adeno-carcinoma of undescended testis. *V*, blood-vessels; *V.D.*, vas deferens.

The animal, a five-year-old fox-terrier, was admitted with a hernia swelling in the left inguinal region. Examination showed a firm, solid enlargement, almost immovable, on the site of the internal abdominal ring. The swelling was not reducible, while the denser part of the growth presented a movable attachment which was palpably not unlike gut.

The scrotum gave a clue to the nature of the condition.

Only one testicle was present and that, for the size of the dog, being unusually small.

The owner's history was that a small swelling was noticed in the groin a few months previously, and had grown rapidly during the last few weeks, though there was no pain and no general disturbance. Cutting down on to the swelling as for hernia a greatly enlarged testicle was removed (fig. 1), severing the cord after gentle tension in order that it may be excised as

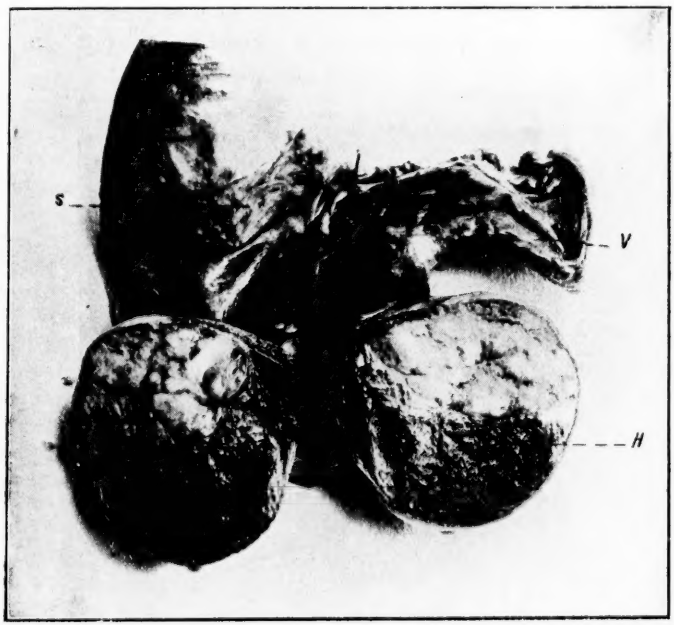

FIG. 2.—Peritoneal sac divided and reflected, and the new growth seen in section, showing: *S*, peritoneal sac; *V*, thrombosed vessels; *H*, hæmorrhagic area of the tumour and the whole gland replaced by new tissue.

high as possible; the inguinal ring and the skin being closed in the usual way.

The testicle, when removed, proved to be much enlarged and rounded, with an equally enlarged epididymis attached, the structure being contained in a thickened tunica vaginalis and situated just external to the abdominal ring, the peritoneal sac in no way communicating with the scrotum.

Section of the organ showed a firm new growth, involving the whole of the tissue of the gland, with a hæmorrhagic area representing the portion of more active growth. At this point ulceration had occurred into the cavity of the sac.

Microscopic examination went to show that the new growth was one of the adeno-carcinoma type. This appears to be in line with the findings on the human side, where new growths of the testis are met with more commonly in the undescended glands and generally take the form of carcinoma.

No secondaries could be discovered in any of the neighbouring lymphatic glands, and as nothing further has been heard from the owner since discharge of the animal, it has been concluded that no complication has occurred.

VISUAL EXAMINATION OF THE BLADDER.

By J. C. LEWIS, D.V.Sc., B.Sc.

In the larger animals the means at our disposal for the examination of the bladder are very limited, if we exclude such instruments as the electric cystoscope; and many cases arise in which it would be of the greatest advantage to get an eye picture of the vesical mucous membrane. In the horse and mare we have had in the past to rely on the use of the catheter and sound, together with rectal or vaginal palpation; but even these methods often fall short where a calculus or new growth is small and where the nature of the mucous membrane is not discoverable by the character of the urine.

Such a case arose in the surgical clinic recently. An aged draught horse was admitted with incontinence of urine which had been becoming progressively worse for the last twelve months, the urine constantly dribbling away, with little or no pain and no acute symptoms.

The bladder, by examination per rectum, contained a large quantity of urine, though the walls were in no way tense and pressure causing a discharge from the urethra. The catheter was passed easily into the bladder, but was not capable of emptying the viscus. It was thus obvious that a certain amount of atony was present, whether or not associated with calculus or growth.

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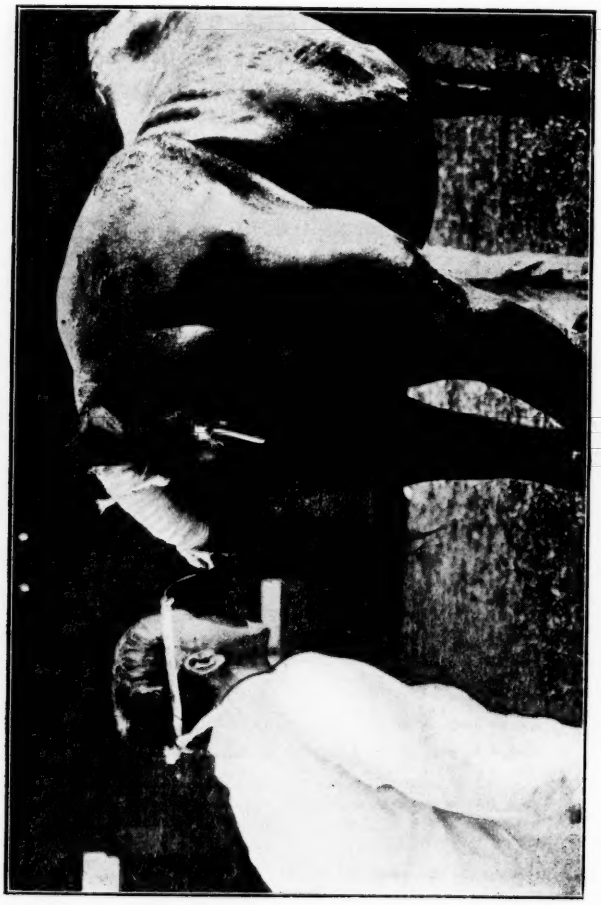

FIG. 3.—Examination of the bladder by means of proctoscope in position in the urethra, and illumination.

A perineal urethrotomy was performed, having a fairly large urethral opening, the mucous membrane being stitched to the skin with silkworm gut. For further examination it was possible from this opening to pass along Kelly's proctoscope into the bladder, the lumen of the urethra taking the tube fairly easily. Good inspection of the whole of the mucous membrane was then possible by illumination with an ordinary frontal mirror.

In this case retention of the urine dependent on atony had produced a chronic cystitis with large areas of sloughing mucous membrane and many hæmorrhagic spots. Whether the cystitis was the cause or result of the retained urine is difficult to determine, but it is not unlikely that a mild infection of the bladder may have been the starting point of the trouble, the constant presence of urine aggravating the condition when atony set in.

It could be seen that very little contraction of the bladder took place and that the urine merely dribbled away as formed, leaving the bladder containing urine to the level of the pelvic outlet. When this residual urine was withdrawn by means of a syringe, a marked line divided the mucous membrane sharply into two portions, the lower one being affected to a much greater degree and representing the part constantly in contact with urine.

By continual withdrawal of the urine and the use of silver nitrate a certain amount of improvement was effected in the condition of the upper part of the bladder, whilst the lower half appeared refractory to all treatment, presenting the same hæmorrhagic appearance with many sloughing areas.

Some weeks of this treatment, daily completely emptying the bladder by means of a syringe, was productive of a visible improvement in tone, but a certain amount of dribbling still persisted, all the urine being voided through the perineal opening.

The case may be used to show that the examination of the bladder by this method (shown in fig. 3) will demonstrate clearly the nature of the internal aspect of the bladder; though, as in the case described, an atonic bladder may afford a better opportunity for the use of this instrument, and it is equally valuable in other cases where calculi or growth has escaped detection by other methods of examination.

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NOTES.

PROFESSOR WOODRUFF, Dean of the Faculty of Veterinary Science, Melbourne University, has been appointed to the rank of major with the Remount Unit of the Expeditionary Forces and is now in Egypt.

Prior to his departure he was entertained by the members of the School staff and presented with a wrist watch as a souvenir of the occasion. The present students took the opportunity of expressing their appreciation and esteem by making Major Woodruff a presentation of an illuminated address and mounted riding crop.

The veterinary profession of Australia is to be congratulated that Major Woodruff is with the Forces and that the Defence Department has been able, by appointment to the rank as he now holds, to suitably recognize his worth and ability. All will join in wishing Professor Woodruff a speedy and safe return.

The demand for veterinary officers has been so great that very few are now available for the Forces now in formation. In view of this the School has made arrangements whereby the course has been shortened considerably by the cutting down of most of the vacations and the condensation of the work. It is hoped that in this way to provide competent men at least six months earlier than in normal times without detracting in any way from the efficiency of the graduates or the standard of the instruction.

Of the Victorian graduates serving at the Front with the Expeditionary Forces as veterinary officers, we might mention: Colonel E. A. Kendall, Captains Matson, Norman McDonald, Heslop, Robin, McLennan, Seelenmeyer, McKenna, Hankin, and Talbot; while many others are engaged in transport or other military work.

Mr. Dickenson, B.V.Sc., a graduate of last year, has been appointed Chief Veterinary Officer to the Northern Territory of Australia, the position being vacated by the resignation of Mr. McEacheran, M.R.C.V.S., who has joined the Veterinary Department of New South Wales.

Arrangements have been made by the Defence Department with the Veterinary Research Institute for a constant supply of antimeningococcal serum, the great advantages gained by the use of the local product having been demonstrated in the treatment of this disease. Mr. Seddon, B.V.Sc., is associated with the work on the veterinary side. A large quantity of serum has already been supplied.

(*End of* AUSTRALIAN SUPPLEMENT. *No.* 1. *March*, 1916.)

XUM

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OSSEOUS DISEASES IN AUSTRALIA.

By W. T. KENDALL, D.V.Sc., M.R.C.V.S.

Bone diseases that are known by different names in different localities are of frequent occurrence, more especially in the coastal regions of Australia.

The so-called cripples, rickets and coast disease in cattle, nasal disease in horses, brittle bones in sheep, and cripples in swine are examples of the terminology in use amongst stock-owners, while osteo-porosis, osteo-malacia, fragillitas osseum and mollitis osseum, &c., are spoken of by veterinary surgeons. The latter names are no more applicable than the former, for in many instances all these pathological conditions are met with in the same animal.

Bone diseases, however, are not nearly so prevalent in farm stock now as they were thirty or forty years ago, for the reason that the soil and climatic conditions which give rise to them, though still existent, are better understood, and effective means of prevention are adopted. In the early days of colonization it was found that if young animals, especially cattle and horses, were allowed to graze too long on poor, innutritious, and indigestible grasses grown on the sandy, heather-covered coastal districts, they almost invariably became rickety, but that, if removed inland to better soil and pasturage during certain times of the year, many escaped an attack, and even affected animals often recovered.

It was found that adult animals, especially heavy milking cows, were very liable to become affected with cripples on poor granity soils, particularly during long periods of drought, and experience has taught the dairy farmers that the disease may be prevented and often cured by giving the cows the separated milk to drink and providing them with a good allowance of bran.

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From thirty to forty years ago the so-called nasal disease (osteo-porosis) was very prevalent amongst young blood horses in training around Melbourne, probably for the reason that nearly all the oaten and wheaten hay, which forms the staple for stable horses, was at that time grown within carting distance of the city, on land that had been cropped continuously without manuring for thirty or more years. As soon, however, as hay began to come in by rail from new ground the disease gradually disappeared, and for many years there was not a case to be seen; it is further interesting to note that during the last few years there has been a mild recrudescence, and probably for the same reason, viz., soil exhaustion.

The question naturally arises: How is it that young racehorses in training are so susceptible to the disease, while ordinary working horses fed on hay and oats grown under the same conditions are rarely affected? The explanation appears to be that young racehorses are put to work at a much earlier age and during the active dentition period, and are consequently more predisposed to dietetic troubles.

Symptoms of Coast Disease in Cattle.

The young animals are unthrifty, stunted, and dwarfed in their growth, the back is arched, the forelegs bowed outward; in some cases to such an extent that the sternum almost touches the ground. The hind legs are bent in the opposite direction, the hocks touching, and the lower parts of the legs spread out like a stool. The head may present the appearance of a two-year-old heifer or steer, while the pelvis is narrow, and the body is that of a pot-bellied calf. The joints, especially the knees and hocks, are often enlarged and distorted, the skin is scurvy and dirty, and the old hair remains unshed. The deciduous teeth are also slow in shedding.

Symptoms of Cripples in Dairy Cattle.

Usually, before any anatomical changes are observable, some members of the herd, generally the best milkers, develop an inordinate propensity for chewing bones, sticks, or any hard substance they can get hold of, even dead rabbits. Stockowners attribute many deaths among cattle to eating poisoned rabbits. That deaths do occur from chewing and swallowing the remains of rabbits is undoubted, but not from the direct effects of the

poisoned wheat or other material used for poisoning the rabbits; they are usually cases of septicæmia from injuries caused to the alimentary canal by swallowed fragments of bone.

The first positive sign of *cripples* is stiffness or lameness in walking, and if the beast be carefully examined, enlargement of one or both knees may be noticed. Similar swellings in other joints may follow, the lameness increases, and the forelegs begin to give way and bend under the weight of the animal, indicating that softening of the bones has commenced. The affected beast assumes an unthrifty appearance, the appetite is not seriously affected, and the quantity of milk may be but slightly diminished. When a milking cow is dried off and put into another pasture she may recover and be all right again when she comes into calve. This is a clear indication that milking when the forage is lacking in the necessary nutritious elements is too heavy a drain on the system; in long periods of drought there is not sufficient moisture in the soil to dissolve the saline plant constituents, consequently both the herbage and the animals subsisting upon it suffer. A similar lack of saline material may also occur from an entirely opposite cause, viz., excessive leaching of poor, sandy, and granity soils during rainy seasons, and it may be due to the effects of growing crops on irrigated areas that they will in time be deficient in bone-forming material.

Symptoms of Nasal Disease in Horses.

The first indication of osseous disease in young horses in training is often great leg weariness after work; this is followed by decided lameness, often mistaken for rheumatism. A careful examination generally reveals some alteration in the bone structures. There may be slight enlargement of the lower extremities of the radial bones just in front of the upper part of the knee-joint, or a slight bulging of the nasal or lachrymal bones. In some cases swelling of the bones is first noticed in the true regions of the temporo-maxillary articulation. Unless an animal so affected is immediately thrown out of work and put out on grass the disease rapidly becomes worse, and the animal is quite unfit for work. The appetite becomes capricious, and the animal has a listless, weary look. A very game colt may throw his lameness off when he goes for a gallop, but suffers for it afterwards. If turned out into a good pasture for a few

XUM

months recovery may take place without further treatment. Lucerne pastures are believed to be the best. As a rule, however, a colt that has had a bad attack seldom recovers sufficiently to be able to race successfully. Good results have sometimes been obtained by administration of phosphate of calcium, arsenical and ferruginous compounds, but it is imperative that the affected horse should cease work and be placed under natural conditions.

FATAL INTESTINAL PARASITISM IN HORSES.

By GEORGINA SWEET, D.Sc., and H. R. SEDDON, B.V.Sc.

Melbourne University Veterinary School.

Following the observations made by one of us (H. R. S.) in the Murray River district in 1915, and recorded in this Journal recently, it was of interest to us to have the opportunity of investigating some cases of fatal intestinal parasitism which occurred in horses in the Sale district in May, 1915. Losses among horses had been occurring near Sale and in many other parts of Victoria during the months of December to May, including the period of the previous observations referred to. We were especially interested, therefore, in investigating cases in a district far removed geographically and in character from the Murray River district, though this part also had been affected by the prevailing drought.

Investigations were made on two properties, one of which was the Sale Common and the other private property.

The Common.—This consists chiefly of morass country, bounded on one side by the river (from which, however, it is fenced off), and on two other sides by a narrow strip of high ground. The high ground shows little vegetation—gum trees and some weeds (chiefly *Senecio lautus*, Soland). The morass is covered with moss (*Sagina procumbens*, L. ? "The spreading pearlwort"), on which a grass (*Paspalum distichum*, L.) is gradually encroaching. It is boggy during the winter, but at the time of our visit was quite dry. The herbage (grass and moss) was very dry, and in its then condition of little value as food. The water supply is by troughs from (1) the river, and (2) a billabong, to which latter the stock also have access. The

Common had been undoubtedly overstocked during the previous few months owing to the lack of pasture elsewhere.

Case 1.—We were fortunate in seeing on the Common one animal, a two-year-old draught colt, showing symptoms which, we were informed, were typical of the "Common disease." These symptoms were: A general unthrifty appearance of the animal; an irregular gait of the hind limbs, marked by a dragging of the toes and a tendency to knuckle over at the fetlock, the limbs being spread wide apart so that the animal rather floundered along; when chased a couple of hundred yards the animal became dyspnœic and stopped. Examined then the m.m. of the conjunctivæ was rather cyanosed, respirations laboured, and the heart beating violently. The animal was not broken-winded. After being allowed to rest for some minutes the animal regained the normal, the conjunctivæ becoming pale but with a yellowish tinge.

The animal was killed, and *post-mortem* examination showed some anæmia, but not very marked. The stomach and large intestines contained a large quantity of ingesta. Nematodes were extremely numerous in cæcum and colon, and many were adherent to the m.m., which showed numerous small ulcerations due to the parasites. There were also a number of *Gastrophilus* larvæ attached to the m.m. of the large colon, and a number of *Anoplocephala perfoliata* and *A. plicata* in the cæcum. The m.m. of the small intestine was normal in appearance. The stomach contained some nodules of *Spiroptera megastoma*, and the pylorus contained numerous *Gastrophilus* larvæ—two species being present. These Spiroptera nodules were not associated with any pyogenic condition affecting the stomach wall or omentum, such as was met with in the cases seen in the Murray River district (*vide infra*), nor was there any splenic infection. There was a small parasitic (*Strongylus vulgaris*) aneurism of the anterior mesenteric artery, and evidence of the same parasite having wandered through the lung, liver, mesenteric lymphatic glands and omentum, small fibrous and calcareous nodules (probably denegerated worms) being present in these organs. There were also two adults lying encysted in nodules in the omentum. Other organs did not present gross lesions. The private property was also visited, and there we found similar cases, one of which was autopsied.

Case 2.—This was a three-year-old mare which had been reared on high ground (some miles away from the swampy parts along the river), and had been during the month of March on the morass portion of its owner's property, *i.e.*, the part abutting on the Common. Thereafter this animal, along with others, has been in other paddocks on the same property. These latter paddocks, although not part of the morass along the river, are themselves rather low and in parts swampy. The animal had showed symptoms for only two days, and died the day before we saw it. We were informed that it showed the same symptoms as those that had died on the Common. The cases on this property were reported to have shown symptoms for only a day or two, and then to have gone down, unable to rise again. (We are of opinion that the symptoms were, in fact, manifested by this stock earlier than stated, but were not noted. This is shown by the owner's remark that he had only one other animal affected, whereas we found three showing very definite symptoms, these symptoms being similar to those shown by Case 1 on the Common.)

Post-mortem examination of the animal was unsatisfactory, the carcase showing marked putrefaction. Numerous nematode parasites were present in the alimentary canal, as in Case 1.

Out of one series of twenty animals which had been depastured similarly to the above mare the owner had lost five within the fortnight preceding our visit. At this time the remainder were being hand-fed, and among them were three showing symptoms of general unthriftiness with irregular gait in the hind limbs. One of these also showed œdema in the pectoral region. These three animals, therefore, seemed to be affected with the same complaint.

The nematodes met with in the intestines of the two cases examined as above were chiefly:—

Strongylus edentatus, *S. vulgaris*.

Cylicostomum labratum, *C. labiatum*, *C. poculatum* and other undetermined species, and *Triodontophorus intermedius*.

Of these nematodes, *Strongylus equinum*, *S. edentatus*, *Cylicostomum labratum*, *C. labiatum*, *C. catinatum* (?) and *C. poculatum*, with some undetermined species, had been met with in specimens from previous fatal cases in the same district.

From our investigations we are of opinion that the cause of the mortality among the horses depastured on the Sale Common and on other morass country in the vicinity is to be ascribed to the combined effects of excessive infestation by the above-named nematode parasites and to the lack of nutritious food, the parasitism being the more intense and serious on account of the

debilitated condition induced by the latter. It will further be seen that the cases now described differ from those observed in the Murray River district in that these Sale cases showed no evidence of secondary splenic infection through Spiroptera nodules, but owed their ill-effects entirely to the intense intestinal parasitism.

Clinicals.

THROMBOSIS OF THE SPERMATIC VEINS.

By J. C. LEWIS, D.V.Sc., B.Sc.
Melbourne University Veterinary School.

A VALUABLE merino ram, aged 4 years, was noticed by the owner to have a swelling in the scrotal region which he believed to be hernia.

The animal had been examined by him, owing to the fact that the season before the ram had obtained very few lambs, and during the present season had been entirely indifferent to the duties expected of him.

On examination it was found that a large fusiform swelling existed in each cord, about 9 in. in length, occupying the space between the abdominal inguinal ring and the testis, tapering away to a point at either extremity. It could be found to terminate just before reaching the ring on the one hand, and that it did not involve the testis on the other.

The swelling in the left cord was the larger. In addition, the testes were much atrophied and abnormally flaccid in consistence, while, owing to the weight of the swellings above them, were dependent almost to the ground.

The condition was easily differentiated from hernia by its consistence and shape and the normality of the abdominal ring.

An area in the line of incision was anæsthetized locally over the whole lateral length of the growth and the part laid open to the cremasteric fascia. This tunic was not thickened, though greatly enlarged to contain the affected structures of the cord. Within the fascia the growth was found to consist of a huge thrombosis involving the pampiniform plexus, surrounding and strangulating the spermatic artery, which, though not occluded by clot, showed practically no lumen, the interference with the arterial supply accounting for the atrophy of the gland.

It was impossible to dissect the thrombosed veins away from the artery by operation, and, considering the state of the testis with the improbability of regeneration, it was considered advisable

to remove the whole structure after ligation, the wound being stitched up with silkworm gut sutures, and a drainage tube inserted at the bottom of the sac.

It is of practical importance to consider what predisposing conditions are associated with this disease, as it is no small loss to have a thousand-guinea ram rendered useless early in his career.

We know in the human subject in connection with varicocele

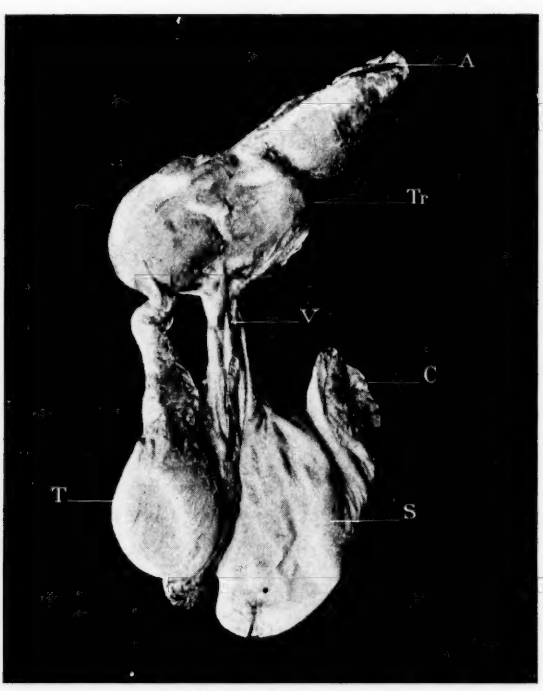

Figure showing testis and thrombosis removed from merino ram. The sac opened and peeled back from the testis. A, spermatic artery; Tr, thrombosis; V, vas deferens; S, sac; T, testis; C, cremaster muscle.

that in many cases the tendency is inherited, and that further certain environment and conditions tend to aggravate the disease. In rams certain of these conditions may operate together with any tendency which may be present. The highly pedigreed hand-fed ram is not called upon for much in the way of exercise, hence the inclination for the blood to become sluggish in the venous system generally. The increased vascularity of the region during the breeding period in a part normally very depen-

dent together with the great length of the spermatic veins, the almost entire absence of valves are all probable factors which influence the occurrence of the disease.

As there were a number of ram lambs by this animal from the previous season on the holding they were examined at the same time, but none showed any similar disease of the cord. There was, however, a ram of about the same age which had been introduced from the same stud from which the affected animal was obtained. Curiously enough, the spermatic cord on either side showed a firm swelling about the size of an egg midway between the abdomen and the testis, and appeared to be the same condition in an earlier stage of development. On either side of this area some varicosity of the venous plexus seemed to exist.

This midway position then seems to point to the starting place of the thrombosis, though there appears to be no apparent reason on anatomical grounds.

Careful inquiry into the history of the stud producing the rams brought forth evidence pointing to several other animals, closely related, being similarly affected, though nothing very definite in the way of history could be obtained. It seems probable that pastoralists have confused the condition with inguinal hernia.

In conclusion, we may state that there seems some evidence of the tendency of the disease to be inherited, that the method of feeding and pampering valuable rams leads to an inactive state that predisposes the animal to loss of circulatory tone, and, further, that it is not advisable to tax the animal's potency with too great a number of ewes.

Regarding operative treatment, when the potency of the animal has already been interfered with, there appears to be no chance of recovery. There is no reason, however, why, if the condition were observed early removal of the thrombosed mass by ligation should not benefit the case. It would mean, however, a systematic examination of the animals periodically in order to recognize the first stages of the disease.

CYSTOCELE IN A COLLIE DOG.

An aged collie dog was admitted to the Surgical Clinic with a large swelling in the perineal region which had been present for some months. The condition appeared to give the animal no inconvenience, except during the defæcatory act when pain was most acute.

Examination of the part under morphine showed that pressure on the swelling produced a flow of urine, and when the bladder

was empty the part still contained quite a mass of dense hard tissue.

As the dog was old the owner preferred that the animal be destroyed. *Post-mortem* examination revealed the bladder dislocated through the pelvis into the perineal region, having broken down the urinogenital diaphragm to occupy a position below the

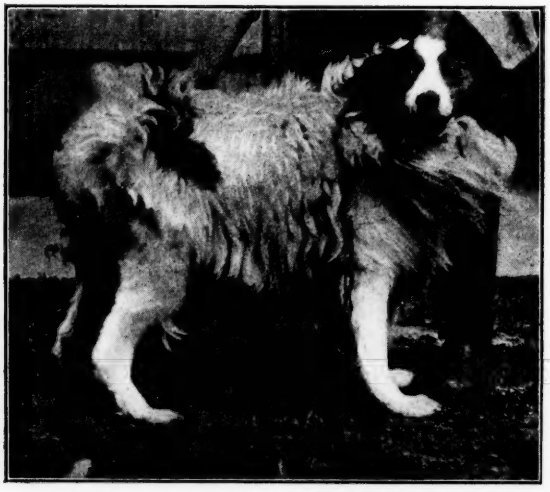

Figure illustrating case in text. The cystocele showing as a large swelling in the perineal region.

anus. The wall of the bladder was densely thickened with several hard fibrous nodular areas, and was intimately adherent to the fascia and skin which alone separated it from the exterior. I should consider the condition of the present case to be inoperable.

The only other case of this nature which appears to be on record is one described by Professor Woodruff some years ago, the condition, strangely enough, being in an aged collie dog.

NOTES.

THE Annual Inaugural Address of the Melbourne University Veterinary School was given at the Research Institute on March 20, the Lord Mayor of Melbourne, Sir David Hennessey, occupying the chair.

Professor A. J. Ewart, D.Sc., Ph.D., F.L.S., Acting Dean of the Faculty of Veterinary Science, delivered the Inaugural Address, entitled "Animal and Plant Co-operation and

Antagonisms." The lecture was well illustrated with lantern slides. The interdependence of the two great kingdoms dealt with was well brought out in the lecture.

Dr. W. T. Kendall, Acting Director of the Institute, then read the Annual Report of the University Veterinary School, 1915.

MR. CHAIRMAN, LADIES AND GENTLEMEN,—Owing to the absence of our Director, Professor Woodruff, who is on active service with the Army Veterinary Corps in Egypt, it falls to my lot to present the Annual Report.

Altogether forty-four Victorian veterinary surgeons, many of them graduates of this School, have enlisted mostly for active service abroad. A few are on transport duty. Some are stationed at the home depôts, and six are serving in the Imperial Army Veterinary Corps. Very few veterinary students have enlisted as combatants, as they have been advised by the Defence Department to complete their course before enlisting for military service, as it is felt, in view of the shortage of qualified veterinary surgeons for the Army, their services as professional men will be of more value to the country than as individuals in the fighting ranks.

When it became obvious that the demand for veterinary surgeons would be greater than could be immediately supplied, it was decided that we should do all in our power to increase the number of available men as rapidly as possible without in any way impairing the efficiency of the graduates. To this end it was arranged to continue working through the vacations, except a short holiday at Christmas and a fortnight before each examination; in this way we are able now to cover the work of the second, third, and fourth academic years in two calendar years with practically the same number of lectures and demonstrations and the same amount of practical work, so that we can turn out men ready for active service from six to twelve months earlier than would be done in the ordinary course, with the understanding that, when so qualified they will immediately volunteer for active service in the Army Veterinary Corps. This and the absence of Major Woodruff has necessitated some rearrangement of the work of the staff, and I am pleased to say that both the staff and the students have entered into the scheme with great enthusiasm.

During the year over 1,100 cases have been treated in the free clinique, including 637 horses, 370 dogs, and 69 cats, the rest being made up of goats, pigs, fowls, cage birds, &c., so that the students have had good opportunity for good practical training. Besides doing practically all the minor operations and dressing, they have seen Dr. Lewis perform a large number of major operations both in the free clinique and for metropolitan

practitioners, and have themselves performed them on the cadaver under his supervision.

During the latter part of last year the Research Institute was engaged, in collaboration with the Bacteriology Department of the University, in the preparation of anti-meningococcal serum for the Defence Department. The work was commenced in July, and supplies of serum of the required potency were produced by the end of September. Over 850 doses were prepared up to the end of December, and the results obtained with this serum have been highly satisfactory.

As a result of this the Federal Government in November last intimated that they would like the work continued during 1916, but on a much larger scale. Arrangements have, therefore, been made for the supply of 10,000 doses before September next. This has necessitated additional accommodation for horses, extra apparatus, and more assistance for both Dr. Bull and Mr. Seddon. The Federal Government have, therefore, provided twelve boxes and an additional operating room at the School with sufficient funds for other requirements.

The work is so divided that the Bacteriology Department prepares the inoculation material and conducts periodical tests of the serum in order to ascertain its potency; the Veterinary School undertakes the inoculation, bleeding, and care of the horses, and the collection, preparation, and distribution of the serum.

It is pleasing to report that the work is proceeding satisfactorily, and there is every reason to expect that all the anti-meningococcal serum required will be available. Experience in the past with the Australian form of cerebrospinal meningitis has shown that anti-serum produced with the local strain of the microbe is more effective than that from strains from elsewhere.

I have also much pleasure in announcing that, in addition to the various scholarships and medals that may be gained by the student during his career, and the Caroline Kay Scholarship for graduates, there is to be, also for graduates, a very handsome Fellowship—the Walter and Eliza Hall Veterinary Science Research Fellowship—granted by the trustees of the Walter and Eliza Hall Trust. This will be of the value of £250 per annum, with a similar amount for expenses.

Medals and prizes awarded during the year are:—

Silver Medal for Proficiency in First Year Subjects: H. E. Albiston.

Payne Exhibition, Gilruth Gold Medal for Pathology and Bacteriology, Royal Agricultural Society's Silver Medal and Prize for Clinical Medicine and Surgery: W. A. Jones.

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XUM

AUSTRALIAN SUPPLEMENT
OF THE
"VETERINARY JOURNAL."

By Members of the Staff of the Veterinary School, Melbourne University, Australia.

Original Communications.

A NEW FORM OF LYMPHANGITIS IN ARMY HORSES.

By CAPTAIN G. G. HESLOP, B.V.Sc. (Melbourne),
Australian Army Veterinary Corps.

In the latter part of July, 1915, during military operations on Gallipoli Peninsula, a disease broke out amongst certain horses belonging to one of the Australian Batteries of Field Artillery, then operating at Cape Helles.

Owing to the similarity of this disease to glanders and farcy, and owing to the fact that the mallein test gave a negative reaction in each case, it has been decided to place these cases on record.

The writer has had no practical experience of glanders, as this disease has never occurred in Australia, but his suspicions of glanders in these animals were supported by several veterinary surgeons in the A.V.C. who saw them and who had had considerable experience with glanders in its clinical manifestations.

Remount No. 6,138.—Bay mare, 7 years, an Australian bred animal, was noticed on July 28th, 1915, with a slight catarrhal discharge from both nostrils; pyrexia (T. 102.9° F.), slight lachrymation from eyes, general dulness and depression, and loss of appetite. This animal was isolated and treated for catarrhal fever, the treatment consisting of light feed (green stuff and bran mashes), salines in the drinking water, and inhalations of ol. eucalypti. Temperature rose to 103.2° F. on the next day, but thereafter dropped and alternated between 100.4° and 101° F. Discharge from nostrils continued and increased slightly, being extremely tenacious and requiring constant spongeing to keep

XUM

the nostrils clean; both nostrils were affected. Schneiderian mucous membranes injected, but there was no ulceration. Lachrymation continued without increasing until ten days after isolation, and then finally subsided, the slight conjunctivitis present being treated with weak ac. boric solution. Six days after isolation this case showed nodular swellings, five in number, varying in size from that of a pea to a hazel nut, situated in the jugular furrow on the right side midway between the throat and sternum. These swellings were at first isolated, but gradually increased in size and had a tendency to run together. On the tenth day the first of these swellings burst and liberated a small quantity of pale amber-coloured fluid, semi-jellylike in consistency and somewhat glutinous.

Further swellings manifested themselves along the jugular furrow, as many as twenty-two being counted extending from the lower third of the jugular furrow to the angle of the lower jaw, but only on the right side. Other swellings appeared on outside of lower jaw and in scapular region of shoulder.

These swellings attained a maximum size of about that of a small walnut and burst in from 5 to 7 days. They continued to discharge pale amber-coloured sticky material, which in some became purulent. These ulcers gave off a peculiar and offensive odour not unlike that given off by that of a bad case of greasy heels. Ulcers enlarged, and in some cases became continuous with others, forming large areas of fungoid-looking ulceration, in and immediately underneath the skin, which ulcers remained refractory to all forms of treatment.

Pharyngeal, submaxillary and sublingual lymph glands became enlarged, hard and exceedingly painful to the touch.

This animal, as will be shown later on, was submitted to a mallein test with negative results.

Remount No. 695.—Brown gelding, aged, Australian bred.

This animal was noticed on August 1st, 1915, with slight cough, slight catarrhal discharge from right nostril, and slight swelling of conjunctiva of right eye, making the eye bulge slightly; both eyes were lachrymating. Animal was dull and depressed, and refused all food, but drank freely. The temperature was 104.2°. Both submaxillary lymph glands were enlarged and painful to manipulation, the right gland being as

large as a walnut. Animal was isolated and placed under treatment similar to Remount No. 6,138.

Catarrhal discharge was present in both nostrils on the following day. It was tenacious and sticky, as in No. 6,138. Right eyelids increased in size and showed profuse lachrymation. Conjunctiva infected very markedly, small isolated petechial spotting on membrana nictitans and five small ulcerations on the margin of the junction of conjunctiva and skin of eyelids, towards inner corner of the eye. Left eye was lachrymating slightly. On the fifth day after isolation small nodular swellings appeared in the jugular furrow on the right side and about midway between the head and the shoulder. These increased in size and broke, discharging a similar material to that from similar nodules in a similar situation in Remount 6,138. This animal was also submitted to a mallein test. While undergoing the test a patch of ulceration about 2.5 cm. long by about 2.5 cm. to 3.5 cm. wide, and several smaller ulcers varying in size from that of a pin's head to a pea, were discovered on the Schneiderian mucous membrane of the right nostril. Small nodules, similar to those on the neck, also appeared on both hind legs about the gaskin when the test was in progress. Some of these latter burst and liberated a discharge exactly similar to that from nodules on the neck.

Remount No. 2,222.—Bay mare, 5 years, Australian bred. This animal had been tethered between No. 6,138 and No. 695 prior to their isolation. This animal was noticed on August 12th, 1915, with enlarged submaxillary glands, that on the right being increased to the size of a walnut, hard and exceedingly painful. There was no nasal discharge with the case, but slight conjunctivitis with lachrymation was present. Temperature was slightly above normal (100.8° F.). Appetite was good. The swelling continued in the submaxillary glands, but the pain subsided, the gland on the left being more freely movable than its more swollen fellow on the right, which appeared to be more immovable than normal. None of these animals (Remounts 6,138, 695 and 2,222) had been wounded for at least a month previous to isolation.

Remount No. 28,458, bay mare, and *Remount No. 639*, brown gelding.—These animals were noticed on August 21,

XUM

1915, to have slightly swollen submaxillary lymph glands, but were otherwise normal. No. 28,458 had a bullet wound in the biceps of the near foreleg; No. 639 was unwounded.

These animals were all sent to the Veterinary Hospital at Cape Helles and mallein tested. Results of the tests were as follow:—

Remount 6,138. Negative.
,, 695. Negative, retained for second test. Negative.
,, 2,222. Doubtful negative; re-tested. Second test, negative.
,, 28,458. Negative.
,, 639. Negative.

Prior to my leaving Cape Helles, both No. 6,138 and No. 2,222 had been returned from the Veterinary Hospital to the units. No. 6,138 had slight intermittent catarrh. Ulcers on neck were healing slowly, the most successful application being a lotion of plumbi acetatis et glycerinum (1 in 8).

No. 6,138 was hit by a piece of shell on September 19, 1915, which fractured the near tibia, and the animal was destroyed. An extensive post-mortem examination was made, but it revealed local lesions only, all the internal organs being healthy and normal. Remount 2,222 on return from Veterinary Hospital showed the submaxillary gland on the right side still enlarged and hard, though slightly reduced in size. It was not painful on manipulation. The enlargement in this gland still persisted when I left the unit on September 26, 1915.

Regarding a Diagnosis.—The clinical appearances suggested glanders, but this suspicion was negatived by the result of the mallein tests. In some respects the symptoms showed a resemblance to those of epizootic lymphangitis, excepting that there was absolute evidence that there were no wounds except to Remount 28,458 to allow of the entrance of organisms of this disease. While the lymphatic glands were swollen and painful, there was no evidence of cording of the lymphatic vessels themselves. The ulcers on the neck increased in size by individual ulcers enlarging and spreading from one to the other by direct continuity, and the breaking away of the intervening tissue.

It is regretted that the military situation did not allow of the collecting and forwarding of material from these cases for bacteriological examination.

ON SUBCUTANEOUS TUBERCULOSIS IN BOVINES.

By H. R. SEDDON, B.V.Sc.,
Lecturer in Pathology and Bacteriology, Veterinary School,
University of Melbourne.

UNDER the term of "tuberculides" lesions of tuberculosis of a peculiar type, occurring subcutaneously, in bovines have been described by various observers from time to time. The condition in the lower animals may be considered rare, and does not seem to have been described in British veterinary literature except on rare occasions. A record by Cust in THE VETERINARY JOURNAL for 1905 I have not been able to consult. Foulerton has described subcutaneous lesions which present certain features in common with the lesions encountered here, but which he considers due to a blastomycotic parasite, though absolute diagnosis was not possible. In our cases yeast-like bodies (such as he found) could not be detected.

Translations have appeared recently of two French articles on the subject, but a more exhaustive article by Pérard and Ramon seems to have escaped notice.

These authors described six cases in cattle in 1913, and as from their article it appears that the macroscopic appearances are often somewhat variable, and positive diagnosis often difficult, the lesions described by them will be referred to at some length.

In their cases the lesions were found both in the subcutaneous tissue and superficial muscles, and presented as round or oval nodules, for the most part freely movable under the skin, but in some adherent to the derma. Of the average size of a nut, they were encapsuled in a fibrous tissue envelope more or less thick, which on section did not present the same appearance in all cases. The majority were firm, homogeneous, and whitish-yellow or greyish in colour, with sometimes pinpoint spots a little darker, apparently corresponding to areas of caseo-calcification; at other times there were irregular radiating streaks recalling the "radiating caseation" of Bongert. Certain small nodules, however, exhibited a central softened area with perhaps traces of calcification. A third variety of lesions intermediate between these two types is also described. Two or even three types of nodules were sometimes found in one animal.

XUM

They further note that the glands corresponding to the region showing these lesions were sometimes tuberculous, but more often free. All their cases, however, were affected with tuberculosis of the lungs, and in the majority of cases in the thoracic lymph glands and often elsewhere. Of these internal lesions some resembled the subcutaneous lesions, but others had all the characters of classic tuberculosis. They note also forms of transition between the two.

As regards microscopical appearance, they note that this was very variable even among nodules which to the naked eye were identical. In the smallest nodules were all the elements of a classic tubercle—lymphocytes, epithelioid cells, giant cells and degeneration. In certain of the larger nodules the central degenerated area showed well-marked caseation with traces of calcification.

In the majority of the large nodules (which to the naked eye show little degeneration), however, the degeneration was incomplete, though affecting a large part of the nodule, and only by staining with Sudan III. were the early stages of caseation demonstrable. In these cases the zone of epithelioid cells was sometimes extremely reduced, as was the zone of mononuclears, and gaint cells were rare. Acid-fast bacilli were not detected in these subcutaneous lesions, except in one case where a single one was found.

Inoculation experiments with emulsion of subcutaneous nodules were interesting. They were negative in two cases and positive in two others. In these two latter, however, the animals (guinea-pigs) were but slightly tubercular—that is, lesions were but slight even six weeks after inoculation. (Inoculation intraperitoneal; miliary granulations on omentum, spleen and liver.) They do not state from what "type" of subcutaneous nodules these animals were inoculated.

Microscopical examination of lung and glandular lesions were always positive, and inoculation of products from these lesions induced intense tuberculosis and death.

Pérard has since (1914) recorded a further case in a cow (also showing tuberculosis elsewhere), in which the lesions differed totally from those previously described by Ramon and himself. A résumé of the article was published in this Journal.

Cauchemez and Césari also describe a case presenting lesions of which absolute diagnosis was not possible, but which they consider was due to tuberculosis. This opinion is supported by the fact that no other cause could be determined, and that the animal came from a stable where tuberculosis existed—three other animals from there, killed the same day, suffering from that disease.

The animal in question (a cow) presented lesions in the lung, bronchial and other lymphatic glands, parietal pleura and the muscles. The bronchial and mediastinal lymphatic glands showed lesions similar to the "radiating caseation" type of tuberculosis. The hepatic and mesenteric lymphatic glands were similar, but the latter showed also some caseous foci which were not shown in the other groups referred to. The lung showed one nodule, the size of a nut, of firm consistence and a little elastic, of pinkish colour, with on section a whitish homogeneous surface giving the illusion of a cancerous metastasis rather than the impression of a lesion of tuberculosis.

The muscular lesions, extraordinarily numerous, were situated in the superficial muscle of the trunk. They presented the form of nodules of pale yellow colour, usually regularly round, varying in size from a millet seed to a pigeon's egg, with granular surface. On the cut surface small and large exhibited a uniform appearance, the lesions appearing to be constituted by an infinity of regular tubercles of the size of a millet seed closely packed together. Only some of the nodules had undergone commencing caseation of the central portion. The prepectoral, presternal and popliteal lymph glands were free.

Microscopical examination of the muscle nodules did not show any acid-fast bacilli or any other bacteria, mycelia, etc., and cultures were negative. Sections of a nodule showed an arrangement identical with that of tuberculosis—that is, round, epithelioid and giant cells and polymorphs.

Three guinea-pigs inoculated with the nodules and killed at the end of three months showed no tubercular or mycotic lesions.

During the past two years two cases have come under our notice, both from different local abattoirs.

Case I.—Two rather flattened nodules about one inch in

XUM

longest diameter, rather dried up (and without adequate history), were submitted, because, though similar in shape and external appearance to the lesion of *Oncocerca gibsoni*, they did not show any evidence of parasite within. Sections showed a similar histology to the lesions presented in Case II.

Case II.—Bull, good condition. Scattered throughout the subcutaneous tissue and superficial muscles, especially of the brisket, neck and thigh, but also over the shoulder, ribs and buttock, were numerous flattened nodules.

The majority of these nodules were rather flattened and roughly circular or oval in contour, while others were almond shaped. In their longest diameter they varied from 1 cm. to 3 cm. There were occasional groups of up to five or six situated closely together, but the majority were scattered singly. Sharply circumscribed, they were but slightly encapsuled. On section they were of a fairly bright yellow colour, tough and on the whole homogeneous, though in some there were small areas lighter in colour. On drying in the air a slight laminated appearance was to be seen, chiefly towards the periphery of the nodule. Scrapings from the nodule were hard to obtain, and showed only cell debris and a few crystals.

Paraffin sections showed the greater part of the nodule to be degenerated, with, as one proceeded towards the periphery, chromatin granules, then epithelioid cells and a thin but definite capsule of fibrous tissue. No giant cells and no organisms were detected.

The precrural lymphatic gland showed typical caseo-calcareous foci of tuberculosis. The other lymph glands were apparently normal, and there were no gross lesions in other organs or parts.

A guinea-pig was inoculated with an emulsion of the lesions from the precrural lymph gland, and died 48 days later. Post-mortem examination showed typical tuberculosis.

Although in these cases no tubercle bacilli could be detected in the nodules, they appear to be similar to cases of subcutaneous tuberculosis elsewhere.

It is to be noted, however, that in the cases referred to, except that described by Pérard (in which the lesions were distinctly different in appearance) there were lesions of the internal

organs, and, further, that in many of the nodules giant cells were found.

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NOTES ON THE EARLY HISTORY OF THE VETERINARY PROFESSION IN VICTORIA.

By W. TYSON KENDALL, D.V.Sc., H.A.R.C.V.S., M.R.C.V.S,

Lecturer Veterinary Medicine and Therapeutics, Veterinary School, University, Melbourne.

IN the early days of its occupation by white people, Australia was not an attractive field for the veterinary surgeon. Domestic animals that had been imported and their offspring enjoyed a remarkable immunity, not only from those epizootic diseases which have caused such devastation amongst the flocks and herds of older countries, but also from ordinary sporadic ailments. This immunity may be attributed to care in the selection of sound, healthy animals for importation, the long and trying voyage, which would eliminate the weak and unhealthy ones, the complete isolation from the countries where animal diseases were prevalent, and the extraordinary salubrity of the climate. Imported under such favourable conditions to a country pre-eminently adapted for their growth and reproduction, and with a food supply and environment unsurpassed, it will be of interest to trace briefly the origin and spread of disease amongst domestic animals.

So long as the original natural conditions remained undisturbed, domestic animals deserve their freedom from disease. They were allowed to roam freely over large areas of country, with every opportunity of choosing their own food, water, and

XUM

shelter. There was no loss of vigour from overcrowding and over-stocking, but, as they continued to breed and multiply out of all proportions to the limited requirements of the then small community, their value depreciated so much that the stock-owners became careless about selecting and mating them. They neglected to castrate and weed out the inferior male animals, and allowed males and females of all ages and relationships to run together, to the certain deterioration of their offspring.

As time went on and the population began to increase, a higher state of domestication became inevitable. The larger holdings were fenced off into smaller ones, the freedom of the animals became more restricted, there was less choice in the matter of feed and water, etc. Seasons of scarcity occurred and checked the growth of the young animals and weakened the resisting powers of the mature ones against disease. Parasitic diseases became prevalent and caused heavy losses. Further, and perhaps discriminate, importations took place, and the time occupied by the voyage became lessened. Scab was introduced from Tasmania. Outbreaks of malignant catarrh occurred in New South Wales as far back as 1834. In 1847, anthrax, then known as Cumberland disease, made its appearance on the Lepington estate, near Campbelltown, New South Wales, and in 1876 the first extensive outbreak occurred in Victoria. How or when the disease was first introduced is not known, but, when investigating the cause of an outbreak in a dairy herd near Geelong some fifteen years ago, I expressed the opinion that it had been introduced with bone meal which had been given to the cattle as a remedy for cripples. I took a sample of the meal to Dr. Cherry, then bacteriologist at the University of Melbourne, who confirmed the conjecture I had formed by making cultures of the anthrax bacilli from the meal. This meal was made from a shipment of bones that had arrived from India a short time before. Two other outbreaks occurred in the Dandenong district through using bone meal from the same source.

In 1858 contagious pleuro-pneumonia was imported by a cow which was diseased when landed, and died within six weeks, having in the meanwhile infected the herd of the importer. In 1870 an outbreak of foot-and-mouth disease occurred amongst cattle. Tuberculosis, tick fever, black leg, and white scour,

contagious abortion, epizootic ophthalmia in cattle, braxy, foot-rot, caseous adenitis in sheep, swine fever in pigs, strangles and influenza in horses have successively appeared, besides many others.

Various indigenous diseases, due to dietetic and other causes, also from time to time have caused heavy losses, and since dairying and closer settlement have been introduced, many, both enzootic and sporadic, diseases have become prevalent.

Pioneer Veterinary Surgeons.—The first veterinary surgeons to arrive in Australia were mostly men who, like others, had caught the gold fever, or were allured by prospects of successful stock-raising or wool-growing. A few no doubt came for health reasons. With the exception of one or two in Sydney and Melbourne, who carried on a more or less precarious practice in connection with shoeing businesses, there were no veterinary surgeons practising except a few unqualified men.

Some, after trying their luck on the goldfields, or in other occupations, either returned to their native land or wandered elsewhere. Among occupations which I have known qualified veterinary surgeons to be engaged in may be mentioned that of gold-digger, squatter, farmer, pound-keeper, trooper, stud-groom, coachman, groom in a cab stable, labourer in a brick-yard, labourer in the cane-fields of Queensland, insurance agent, ship's doctor, police magistrate, chief commissioner of police, member of parliament, and a medical student at the University of Melbourne.

Yet, in spite of this, empiricism was rampant from a very early period. Every city shoeing forge was styled a "Veterinary Shoeing Forge." Cases that were not treated by a qualified veterinary surgeon or a farrier received rough-and-ready treatment at the hands of the owner or some officious neighbour, or were allowed to "rip," if I may use an expression then in vogue. This "rip" treatment consisted in turning a sick or injured animal out to die or recover, as the case might be. The amount of cruelty inflicted both from commission and omission was truly lamentable. Animals were cheap and easily replaced; hence the neglect. A decent hack could be bought for from 10s. to £1. The only animals of value were stud horses, race-horses, and carriers' horses.

XUM

Down to 1880, when I arrived in Victoria, there were not more than a dozen qualified veterinary surgeons practising in the whole of Australia. There was not a single veterinary surgeon wholly employed in Government service in any of the states. It is true that veterinary surgeons inspected imported stock, and made occasional investigations into outbreaks of disease on behalf of the respective Governments. A few held honorary positions in the Defence Departments, and a certain amount of veterinary work was done for the Governments in connection with the Police and Postal Departments.

Amongst the early pioneer veterinarians the most familiar names are those of the Stewarts and Pottie, in Sydney; Shaw, Miscamble, Vincent, Mitchell, and Marsden, in Melbourne; Snowball, in Ballarat; Park at Warranambool; Rogerson, at Stawell; Aked at Dendigo; Chalwin, Bickford and Horton at Adelaide; and Irvine at Brisbane. Some of these had passed away and others had not come on the scene at the time I mention. Of course, there were others who practised at various times for a short while in different places, but their names are less familiar, and they can hardly be regarded as pioneers. The former are, however, the names of men which deserve to be handed down to posterity. The fact that they stuck to their profession and outlived all kinds of difficulties, upheld its dignity in every way, and laid a solid foundation for those who had to follow entitles them to our respect and gratitude. It would have been a pleasing task to have given short biographical sketches of some of these worthies had space permitted, but that must be left to some future occasion.

Stock Departments.—In consequence of the outbreak of scab in sheep, which for a time seriously threatened the wool industry, Scab Acts were passed by the various colonial Governments, and staffs of lay inspectors appointed. Credit must be given to them for the efficient way they carried out their duties under local authorities, and succeeded, in spite of great difficulties, in stamping out the disease. Later, when other epizootic diseases, such as pleuro-pneumonia, anthrax, etc., began to appear, "Diseases in Stock Acts" were passed, and the scab inspectors became stock inspectors. They were, however, far too few in number and wanting in scientific training to cope

with the spread of disease. As might have been expected, there was no systematic or continued effort to suppress or eradicate disease. The areas which they were expected to supervise were far too large, even if they had possessed the necessary scientific knowledge. Not only were heavy losses continually taking place from, to them, unmanageable diseases, but there was a total absence of supervision over meat and dairy produce.

Twenty-five per cent. of the cattle slaughtered for food at some of the suburban abattoirs were at some time affected with tuberculosis, while hydatids, fluke, cancer, and other diseases were quite common; and yet there was no inspection or any adequate restriction on diseased meat going into consumption. There was no veterinary inspection of dairy herds and milk, butter and cheese; the produce of diseased animals was openly sold without let or hindrance. The infant mortality was appalling, and outbreaks of typhoid fever and other diseases were distinctly traceable to insanitary dairies.

Government Veterinary Departments.—The first veterinary surgeon to receive a regular Government appointment was Mr. Anthony Willows, M.R.C.V.S., a fellow student of mine, who arrived in Sydney in 1883, and was appointed Veterinarian to the New South Wales Agricultural Department. He went to the Soudan War with the New South Wales Contingent, and died on the return voyage. Mr. Willows was succeeded by Mr. Edward Stanley, F.R.C.V.S., in 1895. Mr. Archibald Park, M.R.C.V.S, was retained by the Tasmanian Government to inspect imported stock, etc.; while Mr. Chalwin, Adelaide, and Messrs, Mitchell, Marsden, and myself were approved by the Governor in Council to inspect imported stock in Victoria. It was not, however, until 1897 that any regular public veterinary appointment in Victoria was made, when Mr. S. S. Cameron was appointed veterinary surgeon to the Board of Public Health. In 1905 he was transferred to the Agricultural Department, and other appointments soon followed. Other States have also established Government Veterinary Departments, but I do not propose to deal with them here.

Although good work has been done by the original pioneers of the profession individually in warning the public against the danger of animals' diseases, as a body they are numerically

weak and ineffective. Indeed, no attempt had been made to combine and act in unison, and every one seemed to be pulling in a different direction.

Such was the condition of affairs when I arrived in Melbourne; and when I had made up my mind to stay, and had thoroughly considered the situation, I came to the conclusion that there was a great deal of pioneering work yet to be done before the profession could obtain a permanent footing.

Two things appeared to be necessary, viz.:—

1. To overcome the ignorance and prejudice of stock-owners and the general public as to the aim and scope of veterinary science; and
2. To educate men for the veterinary profession who had been reared in the country, and were already acquainted with the special conditions.

The increasing frequency and great mortality caused by outbreaks of diseases such as pleuro-pneumonia and anthrax, caused considerable alarm, as was evidenced by the appointment of Royal Commission to inquire into them; but, instead of invoking the aid of the veterinary profession as they might have done, or even listening to frequent warnings and advice gratuitously given, the most irrational and absurd measures were adopted. Take the case of the first outbreak of the above-mentioned disease—contagious pleuro-pneumonia in cattle. Although diagnosed while yet confined to a single herd by the late Mr. Henry Wragge, M.R.C.V.S., and he had advised the immediate destruction of the whole herd, his advice was ignored; and while a Royal Commission sat to inquire into the cause, etc., the disease got away, and ultimately spread to every State in the Commonwealth.

But this was not the worst of the bungling. Laymen, ignorant of even the elements of pathological knowledge, essayed to inoculate cattle for the prevention of pleuro-pneumonia, and frequently used virus obtained from tuberculous animals, with the result that the latter disease was spread broadcast. That tuberculosis can be spread by pleuro virus obtained from an animal suffering from both diseases at the same time I have proved experimentally. Great mortality was also caused through the use of virus tainted with septic organisms.

The late Mr. Graham Mitchell, F.R.C.V.S., missed no opportunity of pointing out through the public press, and in every possible way, the folly of trusting to lay advisers, but, unfortunately, with little tangible result other than to bring calumny on himself, and to be called an alarmist.

The Hon. John Stewart, M.L.C., M.R.C.V.S., and Mr. T. Chalwin, of Adelaide, likewise did much to enlighten the public on veterinary matters; but it was long before any beneficial effect became apparent. Mr. Mitchell had also written a pamphlet on anthrax.

Seeing that single-handed efforts produced so little effect, I called a meeting of the new veterinary surgeons that were available, and suggested the advisability of forming an association. The meeting was held at Menzies' Hotel, in 1880, the chair being taken by Mr. Mitchell; and it was decided to form an association. At a subsequent meeting, a set of rules which had been drawn up was submitted and approved, and office-bearers thereupon appointed, Mr. Mitchell being elected President, Mr. Vincent treasurer, and myself secretary. Nearly every qualified veterinary surgeon then in Australia joined either as an ordinary or corresponding member, including Sir Charles McMahon, M.R.C.V.S.; the Hon. John Stewart, M.L.C., M.R.C.V.S., Sydney; and Mr. R. Gibton, LL.D., M.R.C.V.S. Monthly meetings were regularly held, and various important questions discussed, and the results published in the daily press. A considerable amount of correspondence was carried on with members in other colonies, and good work was done in apprising the public of the necessity of more scientific efforts being made to suppress animal diseases and protect the public health.

In 1882 *The Australasian Veterinary Journal* was started, and published monthly, of which Mr. Mitchell, T. Chalwin and myself were co-editors. After a period of eighteen months or so, the journal had to be discontinued for financial reasons.

In 1891 a quarterly journal was commenced, viz., *The Veterinary and Live Stock Journal*, edited by Mr. S. S. Cameron, M.R.C.V.S., Mr. Forbes Burn, F.R.H.A.S., and the writer. This periodical had a considerable circulation amongst stock-owners, and it was with great regret that it had to be discontinued after some six or eight numbers had been published.

XUM

In 1901 a third journal was launched, *The Australasian Veterinary Journal*, a quarterly edited by W. A. N. Robertson, G.M.V.C. This also, for lack of support, collapsed after a few issues.

After that *The Farm and Home* opened its columns to the profession, and continued for years to publish specially written veterinary articles under the heading of "The Veterinary Record."

Besides these special publications, the public press had always willingly received articles on veterinary subjects.

In 1884 my small work on "The Diseases of Australian Horses" was published.

The veterinary articles were discontinued in *The Farm and Home* chiefly because the Gazettes and Journals published by the Government Agricultural Departments took up the publication of instructive veterinary articles, and have continued to do so up to the present. Other means of enlightening stock-owners and others on veterinary matters were the reading of papers and giving lectures and demonstrations before agricultural societies at the annual agricultural conventions, and at the annual conferences of the Butter Factory Managers' Association. A series of lectures on horse-shoeing and veterinary first aid was given at the Working Men's College. This work had all been done by private individuals, but is now more effectively carried on by the veterinary officers of the Agricultural Department.

First Attempt to Secure a State Veterinary School.—In 1882 the Veterinary Association succeeded in obtaining, through the then Minister of Lands, the Hon. Walter Madden, a small piece of land in the old police paddock at Richmond as a site for a Veterinary School or College. Although the site was much too small for the purpose, we were glad to get it, in the hope that we might be able to exchange it at some future date for a more suitable one. In this, however, we were disappointed. When it was found that we had made no use of it, and being further influenced by a deputation of Richmond residents who objected to a Veterinary College being established in their midst, the Government cancelled the grant. It will be of interest to relate that Mr. G. Mitchell had, on his

own initiative, instructed an architect to draw plans of the proposed college, and the Veterinary Association was served with plans and specifications. The association, having had no say in the matter, denied liability; thereupon Mr. Mitchell was personally sued for the amount, and was ordered by the court to pay the amount and costs. This broke up the association, and some years elapsed before another was formed.

In consequence of representations I had made through the press as to the great prevalence of tuberculosis amongst cattle slaughtered for human consumption, and demonstrations made before the officers of the Stock Department, the matter was brought before the Upper Chamber by the late Hon. James Buchanan, of Berwick, and a Royal Commission was appointed to inquire into it. A voluminous report of the evidence taken was published, together with numerous photographs of meat affected with different stages of the disease. As an outcome of this, a staff of inspectors was appointed to inspect at the abattoirs and markets, and it was also decided to appoint a qualified veterinary surgeon to inspect the city abattoirs and take statistics of the number of diseased animals slaughtered, and the diseases, etc. Unfortunately, no suitable applicant turned up and the appointment was never made.

During the next few years the profession in Melbourne received some additions, viz., Messrs. Goule, Cohen, Wragge, and Sharp, all of whom settled here. This accession led to the formation of another Veterinary Association, which immediately took up the question of framing a Veterinary Surgeons' Bill to enable stock-owners to distinguish between qualified and unqualified men, and to protect the interests of the profession. This Bill was based chiefly on the then existing English Veterinary Surgeons' Act, and, as secretary of the association, it fell to the writer's lot to make the rough draft. The Bill was brought before Parliament by the late Mr. Bosisto, M.P., and passed after receiving some additions at his hands from the Pharmacy Act, and further changes in the Upper House, particularly the introduction of a most important clause at the instance of the late Hon. Dr. Beaney, providing for a four years' course for qualification of veterinary surgeons.

(To be concluded.)

XUM

Clinical Article.

A CASE OF MELANO-SARCOMA IN THE DOG.

By H. R. SEDDON, B.V.Sc.,
Veterinary School, University of Melbourne.

CASES of melano-sarcoma with metastases in the lungs, spleen, etc., are so commonly associated in Victoria with a primarily ulcerating skin growth, and often, in addition, with the presence of a varying number of pigmented cutaneous warts, that the following case is of interest.

The animal in question, an Irish terrier, had been treated at the Hospital of this School at various times during the past three years for eczema, but at no time were pigmented warts or subcutaneous growths noticed. History of the case previous to this is unobtainable.

He was brought to the Hospital in a semi-comatose condition during January, 1914, but prior to this had not attended here for over six months. The next day the animal was found dead, and post-mortem revealed the following:—Body somewhat emaciated. No pigmented tumours on any part of the body, and none found in the subcutaneous tissue.

Abdomen.—Numerous small deeply pigmented nodules in mesentery and omentum. Lymph glands enlarged and black. Kidneys enlarged almost to the size of the closed fist, nodular on the surface showing black through the capsule; section showed numerous more or less circumscribed areas of new growth, varying in size up to that of a walnut, rather pulpy in consistence and black in colour, almost entirely replacing the cortex and extending into the medulla. Spleen showed two greyish pea-sized nodules in the parenchyma. Liver congested, no apparent infiltration by new growth.

Thorax.—Lungs thickly studded on surface and in parenchyma with black nodules varying somewhat in size but the majority about that of a small pea.

Pericardium showed small black nodules on surface, as did also the epicardium. Under the endocardium were similar nodules varying in size up to that of an almond, and there were some small lesions in the myocardium. Right costal pleura showed a rather diffuse deposit of black growth about one-eighth of an inch in thickness and present chiefly on its posterior portion. Anterior surface of diaphragm showed a similar appearance. Histologically the growth was a melano-sarcoma.

Clinically the experience here with pigmented ulcerating skin growths in dogs is that they are very readily metastatic, lesions being found in the neighbouring lymphatic glands and in the spleen and lungs, and, further, as might be expected, they are rapidly malignant.

XUM